

**ALLOCATION OF THE NAME *SPHYRNA TUDES*
(VALENCIENNES, 1822) AND STATUS OF THE NOMINAL SPECIES
SPHYRNA COUARDI CADENAT, 1951 (CHONDRICHTHYES, SPHYRNIDAE)**

by

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ABSTRACT.— Valenciennes (1822) described *Sphyrna tudes* from several specimens from Nice, Coromandel and Cayenne. The specimen from Coromandel coast, assumed to be lost, was most probably never deposited in MNHN's collection. Today two syntypes still exist in the collection: MNHN 1019 from Cayenne and MNHN 1049 from Nice. Nomenclatural confusion associated with the name *Sphyrna tudes* resulting from assertions that Valenciennes's specimens represent two or more species, causes the present authors to examine the two available syntypes and to conclude that they both represent *Sphyrna tudes* and that the Nice specimen was illustrated by Valenciennes.

As a consequence of our investigations, *Sphyrna couardi* Cadenat, 1951, should be relegated to synonymy with *Sphyrna lewini* (Griffith & Smith, 1834).

RÉSUMÉ.— *Sphyrna tudes* fut décrite par Valenciennes (1822) à partir de plusieurs exemplaires provenant de Nice, de Coromandel et de Cayenne. Le spécimen provenant de la côte de Coromandel, et prétendu perdu, ne fut très probablement jamais déposé dans la collection du MNHN. A présent, il ne subsiste dans la collection que deux syntypes : MNHN 1019 de Cayenne et MNHN 1049 de Nice. Du point de vue de la nomenclature, une certaine confusion est associée au nom de *Sphyrna tudes*; elle résulte du fait que les spécimens examinés par Valenciennes représenteraient deux ou plusieurs espèces. Cette situation amena les présents auteurs à examiner les deux syntypes disponibles, à conclure qu'ils représentent *Sphyrna tudes* et que le spécimen illustré par Valenciennes est celui de Nice.

En corollaire de leurs investigations, les auteurs recommandent la mise en synonymie de *Sphyrna couardi* Cadenat, 1951, avec *Sphyrna lewini* (Griffith & Smith, 1834).

Keywords : Sphyrnidae, *Sphyrna tudes*, MED, ASW French Guiana, Typology, Synonymy, *Sphyrna couardi*, *Sphyrna lewini*.

The name *Sphyrna tudes* (Valenciennes, 1822) has had a very confusing history, at least partially because the specimens examined by Valenciennes represent two or more species and all were late term embryos. Valenciennes stated that « Nous possédons au cabinet plusieurs individus de cette espèce, les uns ont été pris dans la Méditerranée, d'autres nous ont été apportés de Cayenne par M. Leblond, et de la côte de Coromandel par M. Leschenault ». No types were designated by Valenciennes but he referred to specimens from the Mediterranean, Cayenne

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(French Guiana) and Commandel (India). Today two syntypes exist in the Museum national d'Histoire naturelle (MNHN 1019, 1049). The specimen from Coromandal was assumed lost by previous authors but may never have been deposited in the museum because it is not listed in the museum register. According to Duméril (1865), there were five specimens of *S. tudes* from Nice, Algeria and Cayenne, in the MNHN. Fraser-Brunner (1950), apparently without examining the specimens in the MNHN, asserted that the *S. tudes* specimen from Coromandal represented *S. oceanica* Garman (1913) (= *Zygaena lewini* Griffith and Smith, 1834) and one syntype from Nice (MNHN 1049, female 346 mm TL) and the syntype from Cayenne (MNHN 1019, male, 245 mm TL) represented *S. mokarran* (Rüppell, 1837). Fraser-Brunner concluded that the illustrations of the dorsal and ventral aspects of the head in Valenciennes (1822) represented the Coromandal specimen. Tortonese (1950), on the other hand, examined two syntypes of *S. tudes*, MNHN 1019 and 1049, and stated that they were synonymous with *S. bigelowi* Springer, 1944. Gilbert (1961, 1967) agreed with Tortonese that the Nice and Cayenne specimens represented the same species (*S. tudes*) and selected the Nice specimen as the lectotype of this species because it was the specimen illustrated by Valenciennes. However, Cadenat & Blache (1981) examined the two syntypes and concluded that they represented two species, with the Nice specimen representing *S. couardi* Cadenat, 1951 and the Cayenne specimen representing *S. tudes*.

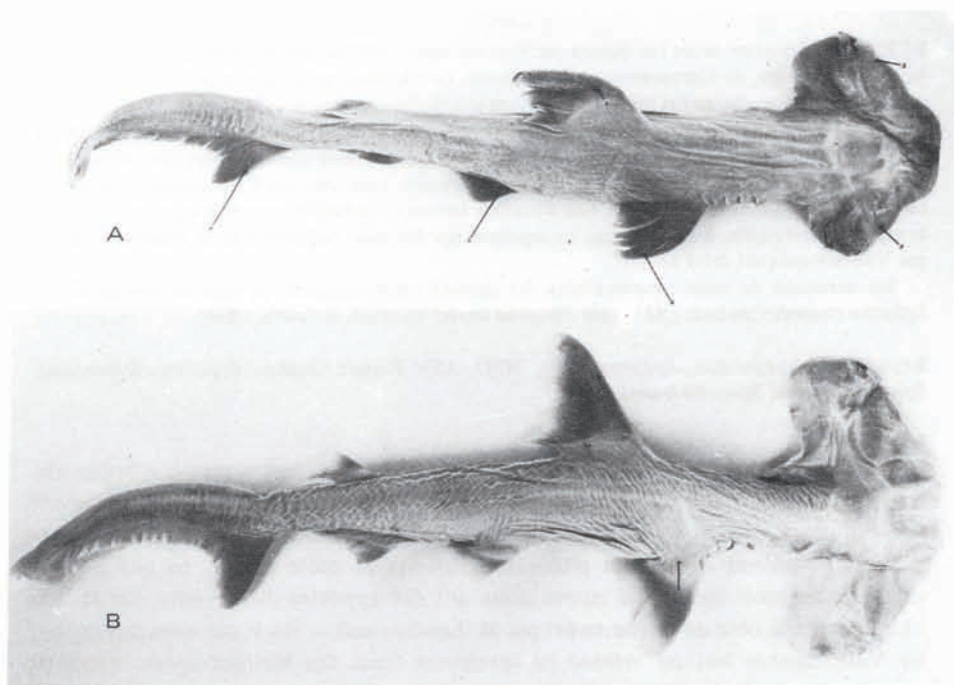


Fig. 1. a : *Sphyrna tudes*, MNHN n° 1019, male 245 mm TL, from Cayenne. b : *Sphyrna tudes*, MNHN n° 1049, female 346 mm TL, from Nice.

Because of this confusion the name *S. tudes* has been applied to three different species of hammerhead sharks. Until 1950 it was generally applied to the great hammerhead shark, *S. mokarran*, and between then and 1981 it was apparently applied to both *S. tudes* and *S. couardi*.

Compagno (1984) recognized the nomenclatorial mess associated with the name *S. tudes* and possible further problem caused by Gilbert's designation of the Nice specimen as the lectotype of *S. tudes*. However, he did not examine the syntypes of *S. tudes* and felt obliged to accept Gilbert's designation. However, he stated that, if Cadenat & Blache (1981) were correct in their assessment, a petition should be submitted to the International Commission on Zoological Nomenclature to have Gilbert's lectotype replaced with the syntype from Cayenne.

Examination of the two syntypes (MNHN 1019 and 1049) of *S. tudes* (Fig. 1 and 2) and Valenciennes' (1822) description of *Zygaena tudes* convinced us they are in fact *S. tudes*. The two specimens possess a distinct median notch on the anterior margin of the head, well developed inner narial grooves, free tip of dorsal fin over pelvic fin origin and posterior margin of anal fin with a concave rather than

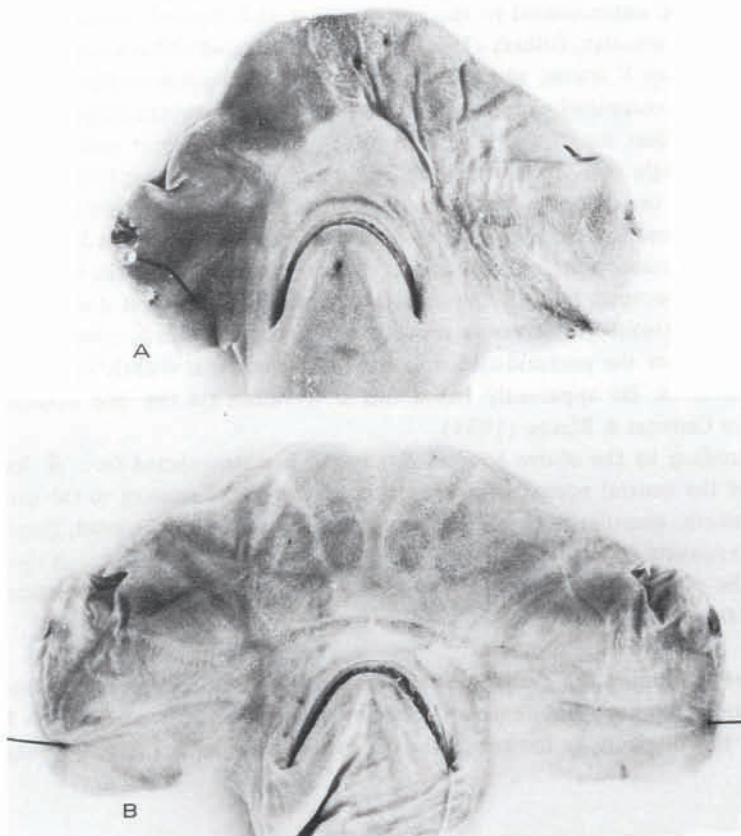


Fig. 2.a : head of *Sphyrna tudes*, MNHN n° 1019. b : head of *Sphyrna tudes*, MNHN n° 1049.

notched margin. The only observable difference noted was on the radiographs, where the Nice specimen was observed to have a rostral fenestra which was lacking in the Cayenne specimen and in all other specimens of *S. tudes* (Gilbert, 1967). Valenciennes' description of *S. tudes* was general and may have very well represented any of the syntypes. However, his illustrations of the dorsal and ventral sides of the head (Pl. 12, Figs. 1a and b) are life-sized, as mentioned in his introduction, and are clearly based on the Nice specimen (MNHN 1049). The drawings are the same size, same proportions and exhibit the same pore pattern as the Nice specimen, except that the median pores of the anterior medial patch are not illustrated.

In delving deeper into the problem we discovered that *S. couardi* and *S. lewini* are very similar and that the available specimens of *S. couardi* cannot be clearly distinguished from *S. lewini*. According to Cadenat (1951), *S. couardi* is distinguished from *S. diplana* Springer, 1941 (= *S. lewini*) by possessing pectoral fins with light ventral tips and posterior orbital margins which extend only to the level of the symphysis of the mouth. In *S. lewini* the pectoral fins have dark ventral tips and the posterior rim of the orbits extend distally to the symphysis of the mouth. Later on, Cadenat (1960) added a minor distinction between the two species in the shape of the pore patch, anterolateral to the mouth : that of *S. couardi* is elliptical and that of *S. lewini* is circular. Gilbert (1967) stated that *S. couardi* has a deeper and more robust head than *S. lewini*, and that the anterior median patch on the ventral aspect of the head is completely separated in *S. couardi*, but separated only posteriorly in *S. lewini*. He also stated that the preorbital process is shorter and has a distinct knob at the angle in *S. couardi*, but is longer and lacks a distinct knob in *S. lewini*. He noted that the olfactory wings (medial tips of the olfactory cartilages) are blunt and do not come to a strong point in *S. couardi* unlike the case in *S. lewini*. Compagno (1984) stated that, in addition to differences in shape of the head and coloration of the pectoral fins, the position of the origin of the first dorsal fin in relation to the pectoral fins serves to separate the two species. In *S. couardi* the dorsal fin origin is over the pectoral midbases and in *S. lewini* it is slightly behind the pectoral insertions. He apparently based this observation on the line drawing of *S. couardi* in Cadenat & Blache (1981).

According to the above sources *S. couardi* is distinguished from *S. lewini* by colour of the ventral pectoral fins, position of the orbits relative to the symphysis of the mouth, ampular pore pattern on the ventral aspect of the head, shape of the lateral expansion of the head, shape of the preorbital processes, shape of the medial tips of the olfactory cartilages and position of the first dorsal fin in relation of the pectoral fins.

After examining the available specimens of *S. couardi*, and *S. lewini* from West Africa, and Cadenat's unpublished notes and photographs housed at the MNHN, most of the distinctions between the two species disappeared, strongly suggesting

that *S. couardi* is synonymous with *S. lewini*. There is no type material of *S. couardi*, and the available specimens consist of two heads (MNHN 1969.273 and 1969.296, Fig. 3), and jaws, and a patch of skin from one specimen (MNHN 1965.108) from Cadenat's collection. The relative position of the posterior margin of the orbits to the symphysis of the mouth appears to vary in the specimens collected from West Africa (Guinea) and identified by Cadenat. In the plate comparing the ventral aspect of the head of *S. tudes* (= *S. mokarran*), *S. diplana* (= *S. lewini*) and *S. couardi* (Cadenat, 1960, plate I), the posterior margin of the orbits is on a level with the symphysis of the mouth in *S. couardi*, and is distinctly posterior to the symphysis in *S. lewini*. However, the relative positions vary in the two heads ; in MNHN 1969.273, the posterior margin of the orbits are on line with the symphysis of the mouth, while in MNHN 1969.296, the line falls posterior to the symphysis as in *S. lewini*. Differences in the ampular pore pattern appear to be of an intraspecific magnitude. In specimen MNHN 1969.273, the anterior median patch

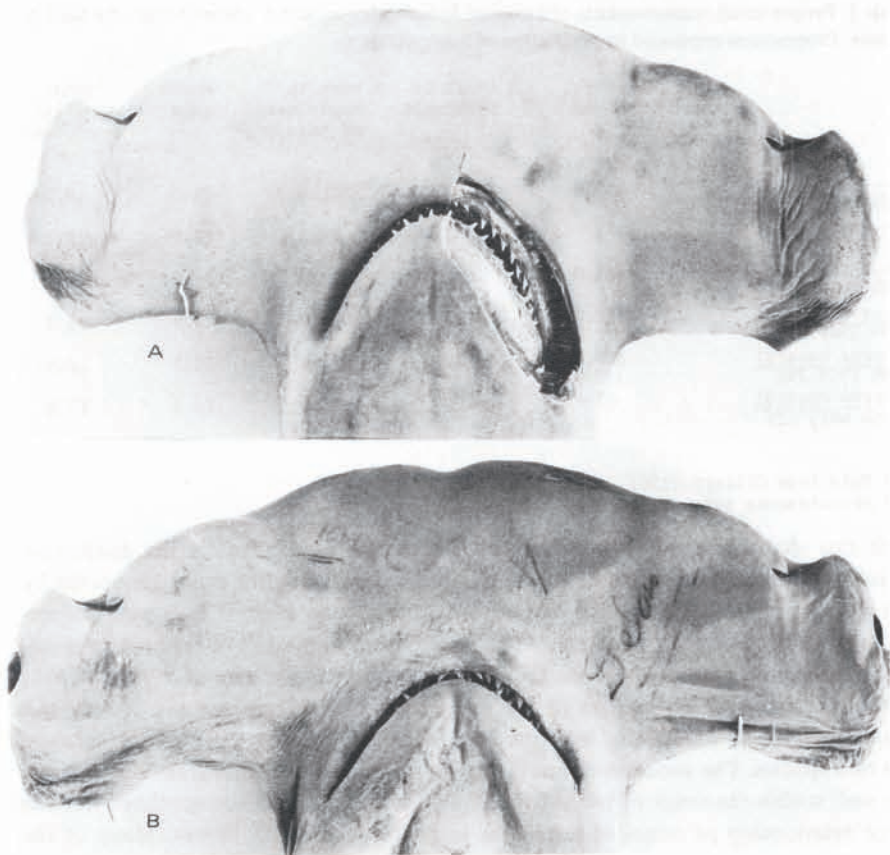


Fig. 3.a : head of *Sphyrna couardi*, MNHN n° 1969.273. b : head of *Sphyrna couardi*, MNHN n° 1969.296.

is divided into right and left halves but in specimen MNHN 1969.296, it is divided only over the posterior one-third of its length as in *S. lewini*. Shape of the lateral oral patch likewise varies from circular to oval between the two specimens. Differences in shape of the head, although rather marked in the specimens illustrated by Cadenat (1960) and Gilbert (1967) appear to be due to individual variation (Table I). The head identified as *S. couardi* by Gilbert (1967) is more stocky than that identified as *S. lewini*. However, a line connecting the posterior margin of the orbits of the *S. couardi* specimen passes posterior to the symphysis of the mouth (plates 9, 10). Also the two heads of *S. couardi* have head proportions intermediate between those listed for the species by Gilbert (1967, Table 10), except that ratios of the length of the inner narial groove to head width are closer to those of *S. lewini*. Radiographs of the two heads of *S. couardi* fail to support the distinctions that Gilbert (1967) noted between the two species. Knobs are well developed on the preorbital process of specimen MNHN 1969.296 and moderately developed in specimen MNHN 1969.273. The medial tips of the olfactory cartilage are pointed

Table I. Proportional measurements of heads of *Sphyrna lewini* and *S. couardi* from the Gulf of Guinea. Proportions expressed in percentage of head width.

	head width	snout to symphysis	nare to post. marg. of head	mouth gape	inner narial groove
<i>Sphyrna lewini</i> USNM uncat. (1)	445.0	21.0	21.0	23.3	18.7
<i>Sphyrna lewini</i> photo only (2)	?	19.1	25.5	22.9	17.8
<i>Sphyrna couardi</i> USNM uncat. (1)	425.0	27.0	27.6	28.1	20.9
<i>Sphyrna couardi</i> MNHN 1969.273	370.0	23.3	23.5	23.5	16.2
<i>Sphyrna couardi</i> MNHN 1969.296	380.0	22.6	21.6	26.2	16.3
<i>Sphyrna couardi</i> photo only (2)	?	21.4	23.5	26.3	17.0

(1) data from Gilbert (1967, table 10)

(2) measurements taken from plate 1 (Cadenat, 1960)

with tips slightly to moderately eroded in the two heads. Finally the distinction in relative position of origin of the dorsal fin and pectoral fins is not supported by the measurement data compiled by Cadenat. Comparison of these data with proportions given for *S. lewini* from the Atlantic Ocean by Gilbert (1967) failed to reveal any consistent differences (Table II). The 780 mm TL specimen of *S. couardi* falls within the range of all but five of the proportional measurements and only one of these, internarial width, can be correlated with the putative distinctions between the two species. The snout to dorsal fin origin and snout to pectoral fin origin ratios are well within the range of ratios for *S. lewini* suggesting that the specimen had the same relationship of origin of dorsal fin to pectoral fins as *S. lewini*. Many of the ratios of the 980 mm TL specimen of *S. couardi* fall outside of those of Gilbert's two specimens of *S. lewini* of comparable length but again the differences do not support the putative distinctions between the two species, and can be attributed to

Table II.— Proportional measurements of *Sphyrna lewini* and *Sphyrna couardi* from the Atlantic Ocean. Proportions expressed as percentage of total length.

	<i>S. lewini</i> 400-700 mm TL (1)	<i>S. couardi</i> 780 mm TL (2)	<i>S. lewini</i> 800-900 / +1000 (1)	<i>S. couardi</i> 980 mm TL (2)
	(3)			
Head width	25.8-28.5 (27.4)	26.5	25.7 / 24.0	26.1
Internarial distance	19.3-21.2 (20.2)	18.5	18.1 / 17.5	18.6
Snout to symphysis	6.7- 7.7 (7.1)	6.8	6.4 / 4.6	6.4
Snout to 1st dorsal fin	26.8-28.5 (27.7)	26.9	25.9 / 23.0	27.3
Snout to 2nd dorsal fin	57.2-60.0 (58.3)	59.0	57.5 / 55.1	59.9
Snout to pectoral insertion	19.9-22.1 (21.2)	20.5	20.0 / 17.7	22.2
Snout to pelvic insertion	42.7-45.6 (44.2)	44.2	42.2 / 39.0	44.2
Horizontal diameter of orbit	1.9- 2.2 (2.1)	1.7	1.9 / 1.4	1.5
Length of 1st dorsal base	9.4-10.6 (10.1)	10.0	9.5 / 9.4	9.9
Length of 2nd dorsal base	3.2- 4.0 (3.6)	3.1	3.5 / 3.5	2.9
Length of 2nd dorsal lobe	4.4- 5.1 (4.8)	4.7	4.8 / 4.8	5.8
Height of 2nd dorsal fin	1.7- 2.3 (2.1)	2.3	2.2 / 2.3	2.6
Length of anal base	4.7- 5.5 (5.2)	4.6	4.7 / 5.3	4.5
Length of anal lobe	3.7- 4.5 (4.0)	4.1	4.0 / 4.0	3.9
Height of anal fin	2.7- 3.3 (2.9)	3.5	2.8 / 2.9	3.5
Length of caudal fin	28.7-31.8 (30.3)	31.0	29.5 / 28.4	30.4

(1) data from Gilbert (1967)

(2) data from Cadenat (unpublished data)

(3) mean value in parentheses

intraspecific variation. The ratios of head width, snout to origin of dorsal fin and snout to origin of pectoral fins are greater than those of *S. lewini*. These ratios do not support the contention that *S. couardi* has a more stocky head or that the origin of first dorsal fin is more anteriorly placed than in *S. lewini*. Only the difference in length of the preorbital cartilage and in coloration of the ventral tip of the pectoral fins remain to separate the two species. We do not feel that the difference in length of the preorbital process is significant and difference in coloration cannot be verified with the available specimens (two heads) and Cadenat's photographs. The ventral tip of the pectoral fins of several specimens photographed by Cadenat appears dusky.

Our investigation corroborates Gilbert's conclusion that the Nice and Cayenne syntypes represent *S. tudes* and that the Nice specimen was figured by Valenciennes. Thus Gilbert correctly designated the Nice specimen as the lectotype of *S. tudes*. We recommend that *S. couardi* be regarded as a junior synonym of *S. lewini*. In addition to the above analysis, our opinion is supported by the improper and inadequate description of *S. couardi*. No type material was designated. The name was introduced as a *nomen nudum* (Cadenat, 1950 : 945). The species was briefly described in « Poissons de mer du Sénégal » (Cadenat, 1951 : 41 (key), 97, 99). On page 318 of the same publication, Cadenat states that this species, *S. couardi*, with many others had not yet been published. Blache provided a description of *S. couardi* based on Cadenat's notes and collection which was published in Cadenat & Blache (1981). Gilbert's (1967) and Compagno's (1984) detailed descriptions of *S. lewini* and *S. couardi* support the synonymy of the two species by demonstrating the paucity of distinctions between them, but must be emended regarding the distributions of *S. lewini* and *S. tudes*. *Sphyrna lewini* is a cosmopolitan tropical

and warm temperate species common or possibly the most common species of *Sphyrna* along the West African coast. *Sphyrna tudes* is common along the tropical and warm temperate coast of South America and it at least rarely occurs in the Mediterranean Sea (based on the lectotype and Tortonese, 1950 and 1956).

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